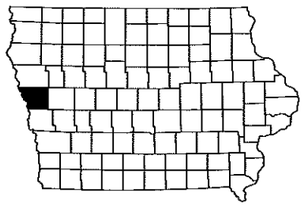
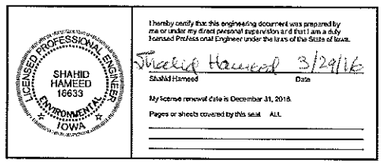
# IOWA DEPARTMENT OF NATURAL RESOURCES

# CONSTRUCTION DOCUMENTS FOR WATER TREATMENT SYSTEM REPLACEMENT LEWIS AND CLARK STATE PARK

# MONONA COUNTY, IOWA

## PROJECT #13-01-67-02






I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Shahid Hameed 3/29/16
Shahid Hameed Date

My license renewal date is December 31, 2016.

Pages or sheets covered by this seal: ALL

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811
Know what's below. Call before you dig.

### DIRECTORY

| PROJECT MANAGER | | CONSTRUCTION INSPECTOR | |
|---|---|---|---|
| COMPANY | IOWA DEPARTMENT OF NATURAL RESOURCES | COMPANY | IOWA DEPARTMENT OF NATURAL RESOURCES |
| ADDRESS | 502 EAST 9TH STREET | ADDRESS | 613 APOLLO RD |
| CITY,STATE,ZIP | DES MOINES, IA 50319 | CITY,STATE,ZIP | HINTON, IA 51024-8827 |
| CONTACT | MIKE HAMEED | CONTACT | JEFF FELTS |
| TELEPHONE | 515-725-8467 | TELEPHONE | 515-250-3712 |
| FAX | | FAX | |
| EMAIL | Mike.Hameed@dnr.iowa.gov | EMAIL | Jeff.Felts@dnr.iowa.gov |

### PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF DRILLING A NEW WELL, NEW WATER TREATMENT BUILDING WITH IRON REMOVAL, SOFTENING AND CHLORINE INJECTION SYSTEM AND DEMOLISHING OF THE OLD TREATMENT BUILDING & TANK AND OTHER INCIDENTAL WORK AS REQUIRED BY D.N.R CONSTRUCTION INSPECTOR AT LEWIS AND CLARK STATE PARK, MONONA COUNTY, IOWA.

### AUTHORIZATION TO BID

AUTHORIZATION - PARKS | WILDLIFE | FISHERIES | LAW ENFORCEMENT | FORESTRY

3/29/16

ENGINEERING BUREAU CHIEF — DATE

### SHEET INDEX



CONSULTANT:


IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034


COVER SHEET

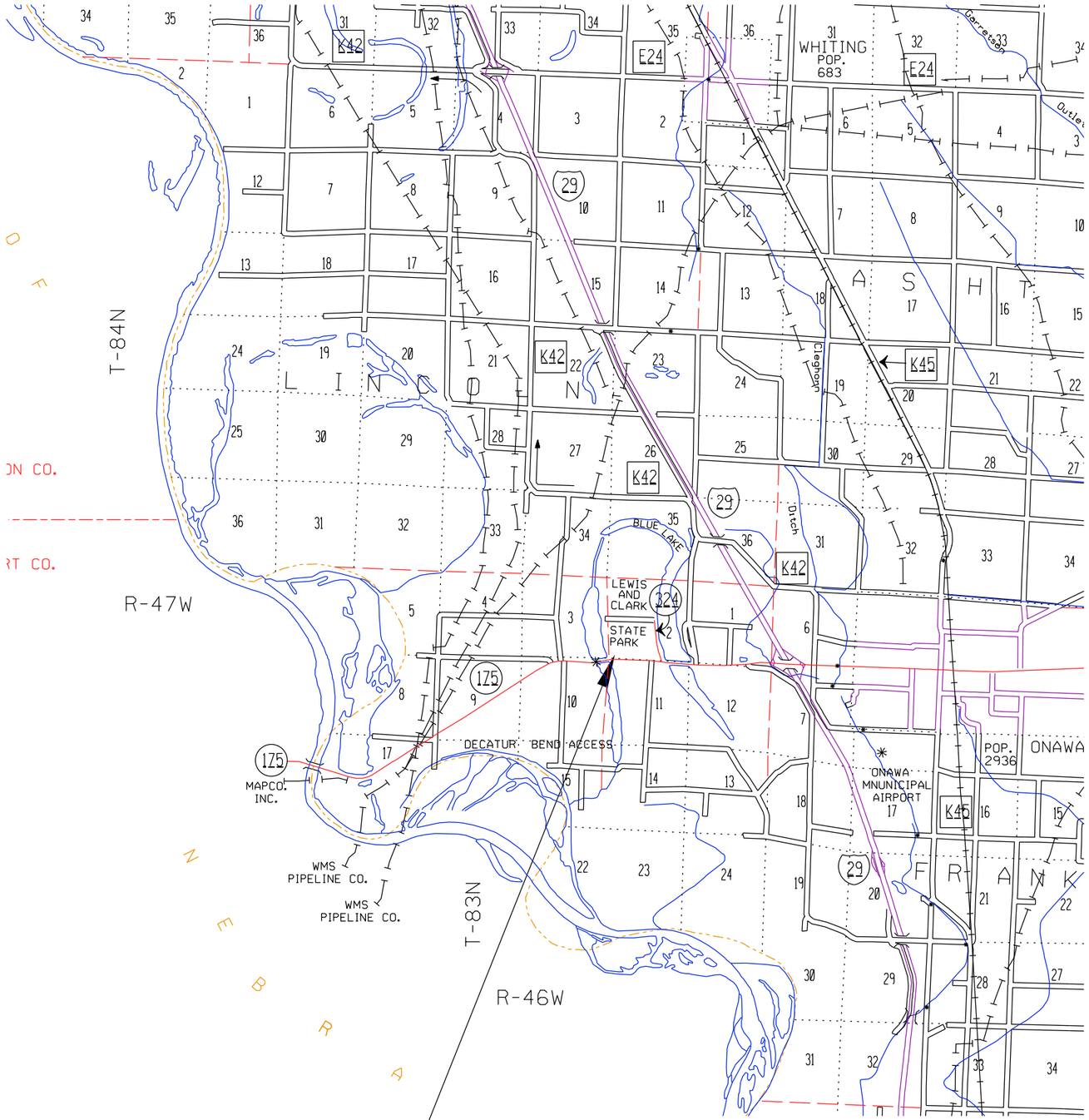
ACCESS ROAD CONSTRUCTION FOR:
LEWIS & CLARK STATE PARK

FREMONT COUNTY, IA.

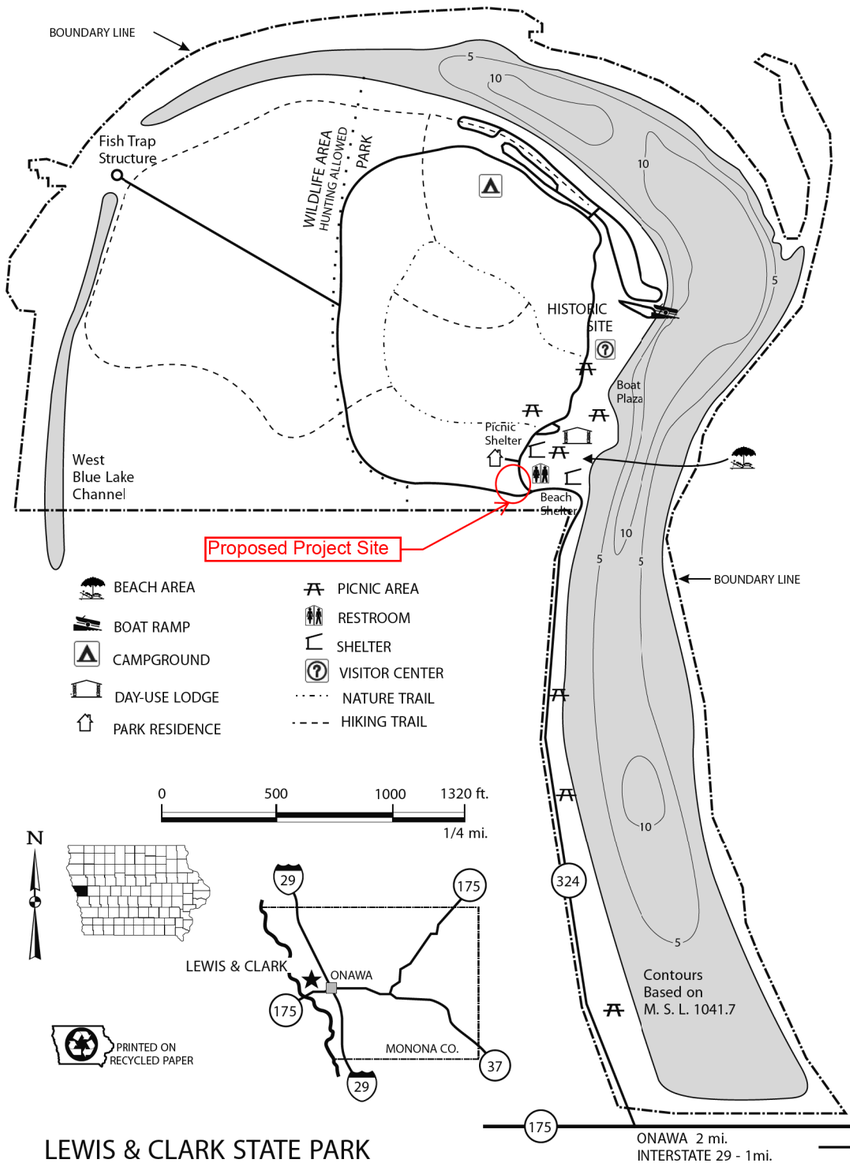
| NO. | BY DATE | REVISION |
|---|---|---|

DRAWN BY: MH
PROJECT NUMBER: 13-01-67-02
CHK'D BY:
DATE: JAN/2016
SHEET No: 01 of 01

A.01




# PROJECT LOCATION




LEWIS & CLARK STATE PARK

CONSULTANT:


IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034


PROJECT LOCATION

ACCESS ROAD CONSTRUCTION FOR:

LEWIS & CLARK STATE PARK

FREMONT COUNTY, IA

| NO. | BY | DATE | REVISION |
|---|---|---|---|
| | | | |

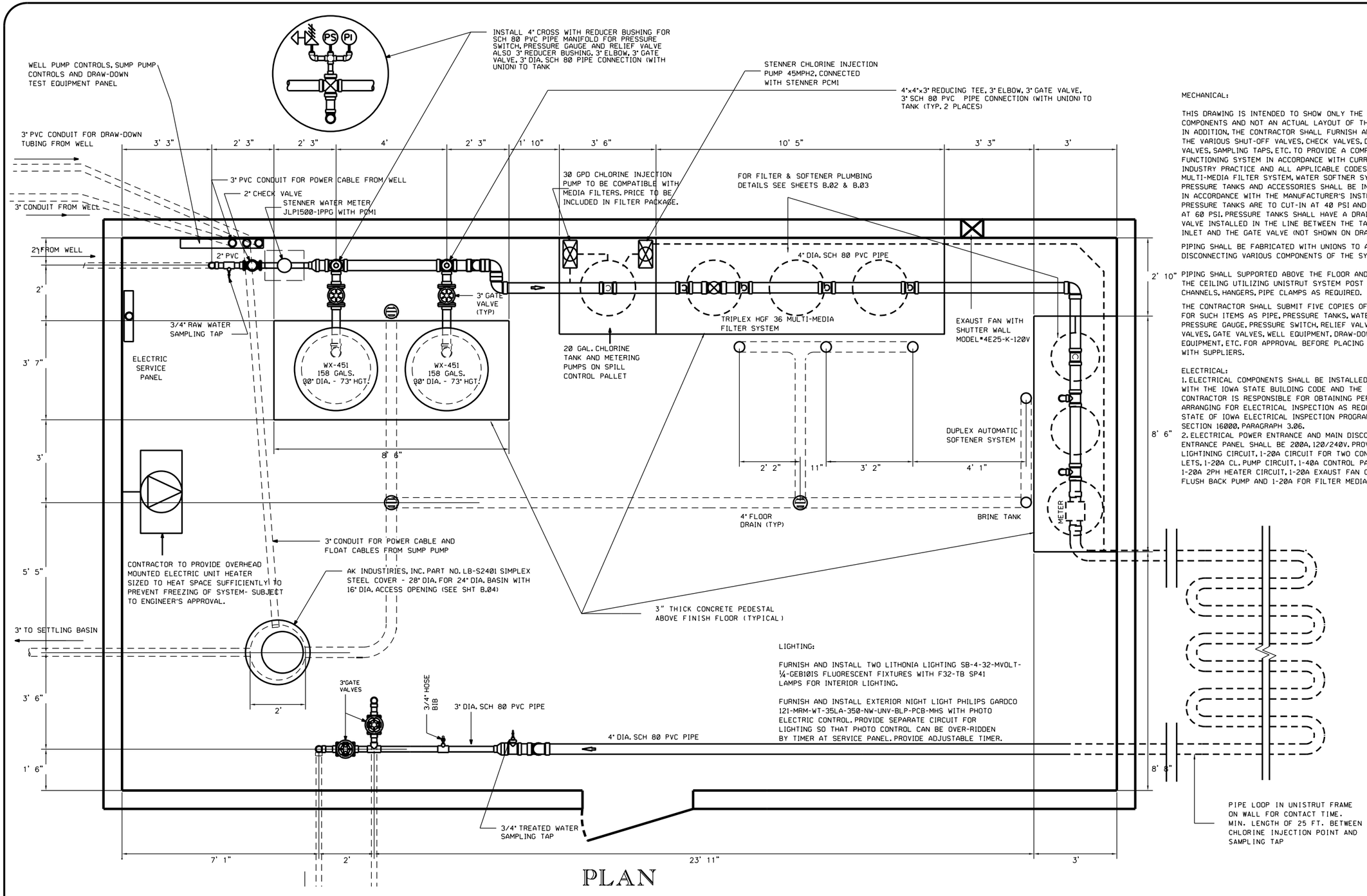
DRAWN BY: MH

PROJECT NUMBER: 13-01-67-02

CHK'D BY:

DATE: JAN/2016

SHEET No: A.02




PLAN

LIGHTING:

FURNISH AND INSTALL TWO LITHONIA LIGHTING SB-4-32-MVOLT-¼-GEB10IS FLUORESCENT FIXTURES WITH F32-TB SP41 LAMPS FOR INTERIOR LIGHTING.

FURNISH AND INSTALL EXTERIOR NIGHT LIGHT PHILIPS GARDCO 121-MRM-WT-35LA-350-NW-UNV-BLP-PCB-MHS WITH PHOTO ELECTRIC CONTROL. PROVIDE SEPARATE CIRCUIT FOR LIGHTING SO THAT PHOTO CONTROL CAN BE OVER-RIDDEN BY TIMER AT SERVICE PANEL. PROVIDE ADJUSTABLE TIMER.

MECHANICAL:

THIS DRAWING IS INTENDED TO SHOW ONLY THE BASIC COMPONENTS AND NOT AN ACTUAL LAYOUT OF THE SYSTEM. IN ADDITION, THE CONTRACTOR SHALL FURNISH AND INSTALL THE VARIOUS SHUT-OFF VALVES, CHECK VALVES, DRAIN-DOWN VALVES, SAMPLING TAPS, ETC. TO PROVIDE A COMPLETE FUNCTIONING SYSTEM IN ACCORDANCE WITH CURRENT INDUSTRY PRACTICE AND ALL APPLICABLE CODES. MULTI-MEDIA FILTER SYSTEM, WATER SOFTNER SYSTEM, PRESSURE TANKS AND ACCESSORIES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. PRESSURE TANKS ARE TO CUT-IN AT 40 PSI AND CUT-OUT AT 60 PSI. PRESSURE TANKS SHALL HAVE A DRAIN-DOWN VALVE INSTALLED IN THE LINE BETWEEN THE TANK INLET AND THE GATE VALVE (NOT SHOWN ON DRAWING).

PIPING SHALL BE FABRICATED WITH UNIONS TO ALLOW DISCONNECTING VARIOUS COMPONENTS OF THE SYSTEM.

PIPING SHALL SUPPORTED ABOVE THE FLOOR AND HUNG FROM THE CEILING UTILIZING UNISTRUT SYSTEM POST BASES, CHANNELS, HANGERS, PIPE CLAMPS AS REQUIRED.

THE CONTRACTOR SHALL SUBMIT FIVE COPIES OF SHOP DRAWINGS FOR SUCH ITEMS AS PIPE, PRESSURE TANKS, WATER METER, PRESSURE GAUGE, PRESSURE SWITCH, RELIEF VALVE, DRAIN VALVES, GATE VALVES, WELL EQUIPMENT, DRAW-DOWN TEST EQUIPMENT, ETC. FOR APPROVAL BEFORE PLACING ORDER WITH SUPPLIERS.

ELECTRICAL:
1. ELECTRICAL COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE IOWA STATE BUILDING CODE AND THE N.E.C THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING PERMITS AND ARRANGING FOR ELECTRICAL INSPECTION AS REQUIRED BY THE STATE OF IOWA ELECTRICAL INSPECTION PROGRAM. SEE SPEC. SECTION 16000, PARAGRAPH 3.06.
2. ELECTRICAL POWER ENTRANCE AND MAIN DISCONNECT: ENTRANCE PANEL SHALL BE 200A, 120/240V. PROVIDE 1-20A LIGHTNING CIRCUIT, 1-20A CIRCUIT FOR TWO CONVENIENCE OUTLETS, 1-20A CL. PUMP CIRCUIT, 1-40A CONTROL PANEL CIRCUIT, 1-20A 2PH HEATER CIRCUIT, 1-20A EXAUST FAN CIRCUIT, 1-20A FLUSH BACK PUMP AND 1-20A FOR FILTER MEDIA AND SOFTNER.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

MECHANICAL LAYOUT

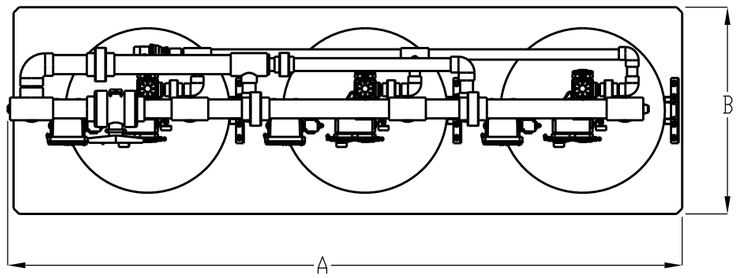
WATER TREATMENT SYSTEM REPLACEMENT

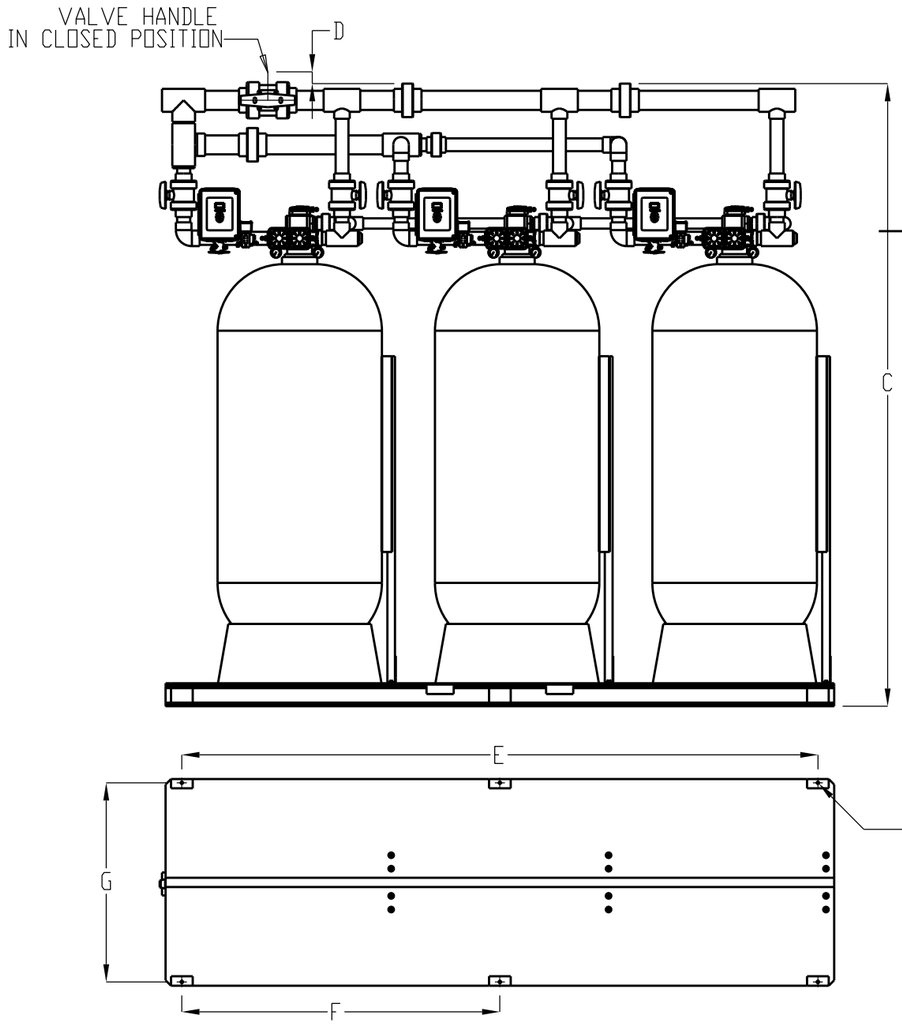
LEWIS & CLARK STATE PARK

MONONA COUNTY, IOWA

| NO. | BY / DATE | REVISION |
|---|---|---|

DRAWN BY: MH
PROJECT NUMBER: 13-01-67-02
CHK'D BY:
DATE: 7/9/2015
SHEET No: B.01







NOTE: USE THIS DRAWING FOR PLUMBING DETAILS ONLY. ACTUAL FILTER MODEL USED IS HGF-36 TRIPLEX CULLSORB FILTERS.

| P/N | Model | System Length A | System Width B | System Height C | Valve Handle D | Inlet | Outlet | Skid Floor Mounting Hole E | Skid Floor Mounting Hole F | Skid Floor Mounting Hole G |
|---|---|---|---|---|---|---|---|---|---|---|
| 01026623 | HDF-20-T,Duplex,Prl,Galv,Skid | 82.0 | 38.0 | 97.5 | 4.5 | 2" NPT | 2" NPT | 50.00 | | 24.63 |
| 01026624 | HDF-24-T,Duplex,Prl,Galv,Skid | 82.0 | 38.0 | 104.5 | 4.5 | 2" NPT | 2" NPT | 50.00 | | 24.63 |
| 01026625 | HDF-30-T,Duplex,Prl,Galv,Skid | 83.5 | 38.0 | 109.0 | 4.5 | 2" NPT | 2" NPT | 76.00 | | 36.63 |
| 01026626 | HDF-36-T,Duplex,Prl,Galv,Skid | 86.5 | 38.0 | 111.5 | 4.5 | 2" NPT | 2" NPT | 76.00 | | 36.63 |
| 01026627 | HDF-20-T,Duplex,Prl,PVC,Skid | 82.0 | 38.0 | 101.5 | 0.5 | 2" Soc | 2" Soc | 50.00 | | 24.63 |
| 01026628 | HDF-24-T,Duplex,Prl,PVC,Skid | 82.0 | 38.0 | 108.5 | 0.5 | 2" Soc | 2" Soc | 50.00 | | 24.63 |
| 01026629 | HDF-30-T,Duplex,Prl,PVC,Skid | 84.0 | 38.0 | 113.5 | 0.5 | 2" Soc | 2" Soc | 76.00 | | 36.63 |
| 01026630 | HDF-36-T,Duplex,Prl,PVC,Skid | 87.0 | 38.0 | 115.5 | 0.5 | 2" Soc | 2" Soc | 76.00 | | 36.63 |
| 01026631 | HDF-20-T,Triplex,Prl,Galv,Skid | 123.0 | 38.0 | 97.5 | 4.5 | 2" NPT | 2" NPT | 78.00 | 39.00 | 24.63 |
| 01026632 | HDF-24-T,Triplex,Prl,Galv,Skid | 123.0 | 38.0 | 104.5 | 4.5 | 2" NPT | 2" NPT | 78.00 | 39.00 | 24.63 |
| 01026633 | HDF-30-T,Triplex,Prl,Galv,Skid | 123.5 | 38.0 | 109.0 | 4.5 | 2" NPT | 2" NPT | 117.00 | 58.50 | 36.63 |
| 01026634 | HDF-36-T,Triplex,Prl,Galv,Skid | 126.5 | 38.0 | 111.5 | 4.5 | 2" NPT | 2" NPT | 117.00 | 58.50 | 36.63 |
| 01026635 | HDF-20-T,Triplex,Prl,PVC,Skid | 123.0 | 38.0 | 101.5 | 0.5 | 2" Soc | 2" Soc | 78.00 | 39.00 | 24.63 |
| 01026636 | HDF-24-T,Triplex,Prl,PVC,Skid | 123.0 | 38.0 | 108.5 | 0.5 | 2" Soc | 2" Soc | 78.00 | 39.00 | 24.63 |
| 01026637 | HDF-30-T,Triplex,Prl,PVC,Skid | 124.0 | 38.0 | 113.5 | 0.5 | 2" Soc | 2" Soc | 117.00 | 58.50 | 36.63 |
| 01026638 | HDF-36-T,Triplex,Prl,PVC,Skid | 127.0 | 38.0 | 115.5 | 0.5 | 2" Soc | 2" Soc | 117.00 | 58.50 | 36.63 |
| 01026639 | HRF-20-T,Duplex,Prl,Galv,Skid | 82.0 | 38.0 | 97.5 | 4.5 | 2" NPT | 2" NPT | 50.00 | | 24.63 |
| 01026640 | HRF-24-T,Duplex,Prl,Galv,Skid | 82.0 | 38.0 | 104.5 | 4.5 | 2" NPT | 2" NPT | 50.00 | | 24.63 |
| 01026641 | HRF-30-T,Duplex,Prl,Galv,Skid | 83.5 | 38.0 | 109.0 | 4.5 | 2" NPT | 2" NPT | 76.00 | | 36.63 |
| 01026642 | HRF-36-T,Duplex,Prl,Galv,Skid | 86.5 | 38.0 | 111.5 | 4.5 | 2" NPT | 2" NPT | 76.00 | | 36.63 |
| 01026643 | HRF-20-T,Duplex,Prl,PVC,Skid | 82.0 | 38.0 | 101.5 | 0.5 | 2" Soc | 2" Soc | 50.00 | | 24.63 |
| 01026644 | HRF-24-T,Duplex,Prl,PVC,Skid | 82.0 | 38.0 | 108.5 | 0.5 | 2" Soc | 2" Soc | 50.00 | | 24.63 |
| 01026645 | HRF-30-T,Duplex,Prl,PVC,Skid | 84.0 | 38.0 | 113.5 | 0.5 | 2" Soc | 2" Soc | 76.00 | | 36.63 |
| 01026646 | HRF-36-T,Duplex,Prl,PVC,Skid | 87.0 | 38.0 | 115.5 | 0.5 | 2" Soc | 2" Soc | 76.00 | | 36.63 |
| 01026647 | HRF-20-T,Triplex,Prl,Galv,Skid | 123.0 | 38.0 | 97.5 | 4.5 | 2" NPT | 2" NPT | 78.00 | 39.00 | 24.63 |
| 01026648 | HRF-24-T,Triplex,Prl,Galv,Skid | 123.0 | 38.0 | 104.5 | 4.5 | 2" NPT | 2" NPT | 78.00 | 39.00 | 24.63 |
| 01026649 | HRF-30-T,Triplex,Prl,Galv,Skid | 123.5 | 38.0 | 109.0 | 4.5 | 2" NPT | 2" NPT | 117.00 | 58.50 | 36.63 |
| 01026650 | HRF-36-T,Triplex,Prl,Galv,Skid | 126.5 | 38.0 | 111.5 | 4.5 | 2" NPT | 2" NPT | 117.00 | 58.50 | 36.63 |
| 01026651 | HRF-20-T,Triplex,Prl,PVC,Skid | 123.0 | 38.0 | 101.5 | 0.5 | 2" Soc | 2" Soc | 78.00 | 39.00 | 24.63 |
| 01026652 | HRF-24-T,Triplex,Prl,PVC,Skid | 123.0 | 38.0 | 108.5 | 0.5 | 2" Soc | 2" Soc | 78.00 | 39.00 | 24.63 |
| 01026653 | HRF-30-T,Triplex,Prl,PVC,Skid | 124.0 | 38.0 | 113.5 | 0.5 | 2" Soc | 2" Soc | 117.00 | 58.50 | 36.63 |
| 01026654 | HRF-36-T,Triplex,Prl,PVC,Skid | 127.0 | 38.0 | 115.5 | 0.5 | 2" Soc | 2" Soc | 117.00 | 58.50 | 36.63 |

| REVISION DESCRIPTION | DCO# | BY | DATE |
|---|---|---|---|
| Release Data Sheets | 013937 | MKM | 08-15-13 |

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The 3-D file for this item is the controlling document, from which all component and feature dimensions should be referenced and held, excluding threads. The intent of this drawing is to identify critical dimensions and tolerances for inspection.



MATERIAL

SIZE: B | DRAWN BY: MKM

SCALE: 1:25 | APPROVED BY: MKM

SHEET: 1 OF 1 | APPROVED DATE: 08-15-13

TOLERANCES, UNLESS OTHERWISE SPECIFIED

| LAST DIGIT | TOLERANCE (inches) | (millimeters) |
|---|---|---|
| 0. | ± 0.030 | ± 0.76 |
| 0.0 | ± 0.015 | ± 0.38 |
| 0.00 | ± 0.010 | ± 0.25 |
| 0.000 | ± 0.005 | ± 0.13 |
| ANGULAR | ± 0.5 ° | ± 0.5 ° |

PART DESCRIPTION: HF42 Systems Skid Mounted

PART NUMBER: DRW-1045

REV: A

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES

ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

MULTI-MEDIA FILTER SYSTEM

WATER TREATMENT SYSTEM REPLACEMENT

LEWIS & CLARK STATE PARK

MONONA COUNTY, IOWA

| NO. | BY DATE | REVISION |
|---|---|---|

DRAWN BY: MH

PROJECT NUMBER: 13-01-67-02

CHK'D BY:

DATE: 7/9/2015

SHEET No: B.02

Spec Seq#:

NOTES:

(1) ITEMS SHOWN IN BROKEN LINES TO BE FURNISHED BY THE CONTRACTOR.

(2) ALL DIMENSIONS ARE ± 1 INCH (25mm) AND SUBJECT TO CHANGE WITHOUT NOTICE.

(3) UNIONS SHOULD BE LOCATED ON INLET AND OUTLET CONNECTIONS OF CONTROL VALVE TO FACILITATE SERVICING.

(4) THE USE OF DISSIMILAR METALS IN A PIPING SYSTEM IS NOT RECOMMENDED. WHERE DISSIMILAR METALS MUST BE CONNECTED IN A WATER SYSTEM. THE USE OF NONCONDUCTIVE (DIELECTRIC) FITTINGS MAY REDUCE GALVANIC CORROSION.

(5) AN ELECTRICAL OUTLET SHOULD BE PROVIDED WITHIN FIVE FEET OF THE EQUIPMENT LOCATION.

(6) ALLOW A MINIMUM OF 24 INCHES ABOVE SOFTENER FOR FILLING.

(7) TO PERMIT THE OBSERVATION OF THE DRAIN FLOW DO NOT MAKE A DIRECT CONNECTION TO THE DRAIN. PROVIDE AN AIR GAP OF AT LEAST FOUR TIMES THE DIAMETER OF THE DRAIN PIPE OR CONFORM TO LOCAL SANITATION CODES.

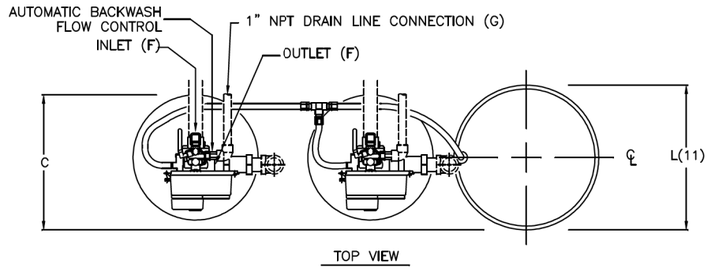
(8) WHEN USING A WATER METER, THERE MUST BE A MINIMUM AMOUNT OF STRAIGHT PIPE BEFORE AND AFTER THE SENSOR. REFER TO THE INSTALLATION INSTRUCTIONS FOR DETAILS.

(9) SYSTEM USES FRP TANKS WHICH MUST NOT BE SUBJECTED TO VACUUM. INSTALL SIPHON BREAK ON DRAIN LINE. INSTALL VACUUM BREAKER ON INLET PIPING IF THE SERVICE LINE IS SUBJECT TO A VACCUM.

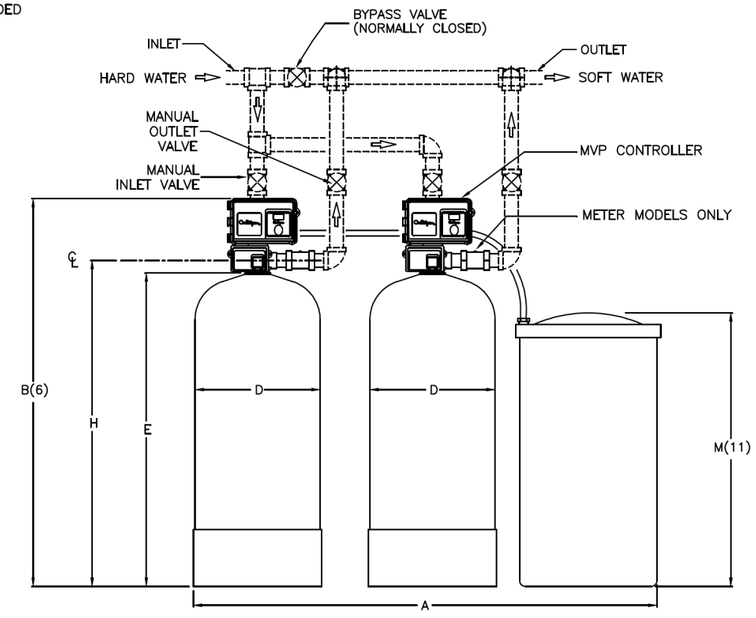
(10) FOR MAXIMUM PROTECTION OF THE CONTROLLER, IT IS RECOMMENDED THAT A DEDICATED 120 VOLT CIRCUIT IS PROVIDED.

(11) BRINE TANK DIMENSIONS SHOWN ARE FOR THE BRINE TANK MOST COMMONLY SELECTED FOR USE WITH THIS SIZE SYSTEM.

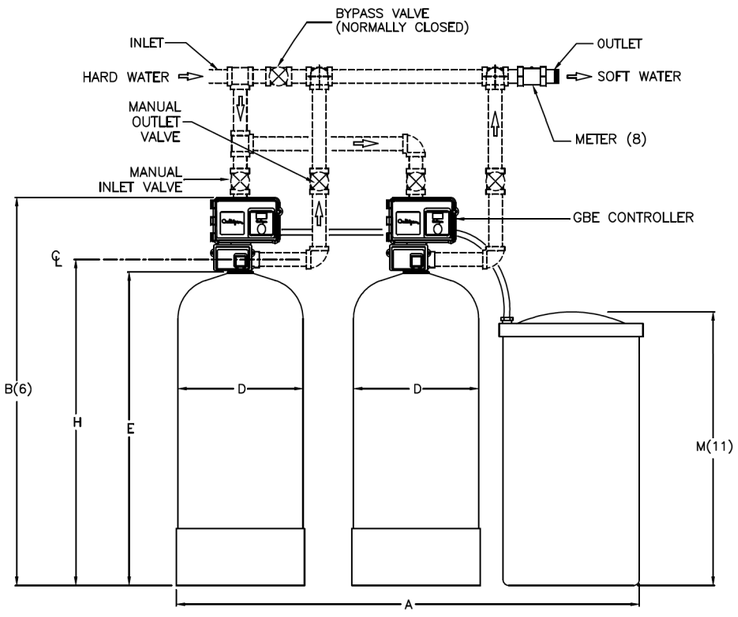
| | DIMENSIONS (INCHES) | | | | | | | | | | UNIT DATA PER TANK | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODEL | WIDTH A | HEIGHT B(6) | DEPTH C | TANK DIA. D | TANK HEIGHT E | INLET/OUTLET PIPE SIZES F | DRAIN SIZE G | FLOOR TO INLET H | BRINE TANK DIA. L(11) | BRINE TANK HEIGHT M(11) | MAX. CAPACITY KGR @ SALT DOSAGE | RESIN VOLUME $ft^3$ | CONTINUOUS FLOW gpm @ 15 psi drop | PEAK FLOW gpm @ 25 psi drop | DRAIN FLOW gpm | MIN. DRAIN PIPE SIZE IN. | DUPLEX OPER. WT. lbs. | DUPLEX SHIP. WT. lbs. |
| HCE–120–2 | 72 | 78 | 20 | 16 | 65.2 | 2.0 | 1.0 | 67.4 | 24 | 50 | 120 @ 60 | 4 | 45 | 60 | 8 | 1.0 | 2210 | 880 |
| HCE–150–2 | 76 | 79 | 21 | 18 | 66.3 | 2.0 | 1.0 | 68.5 | 24 | 50 | 150 @ 75 | 5 | 60 | 78 | 8 | 1.0 | 2600 | 1060 |
| HCE–210–2 | 82 | 80 | 22.5 | 21 | 67.1 | 2.0 | 1.0 | 69.3 | 24 | 50 | 210 @ 105 | 7 | 58 | 76 | 8 | 1.0 | 2950 | 1310 |
| HCE–300–2 | 94 | 87 | 27 | 24 | 74.7 | 2.0 | 1.0 | 76.9 | 30 | 50 | 300 @ 150 | 10 | 65 | 85 | 15 | 1.25 | 4080 | 1800 |
| HCE–450–2 | 106 | 92 | 30 | 30 | 78.9 | 2.0 | 1.0 | 81.1 | 30 | 50 | 450 @ 225 | 15 | 75 | 100 | 25 | 1.5 | 5590 | 2770 |




TOP VIEW




PARALLEL DUPLEX INSTALLATION




ALTERNATING DUPLEX INSTALLATION

# Hi-Flo 3e

CAD File: Hi-Flo 3e Softener Duplex 2in.dwg

| DO NOT SCALE DRAWING TOLERANCES: ±1/8" UNLESS OTHERWISE NOTED | | | | |
|---|---|---|---|---|
| Let. | Change | By | App | Date |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Culligan® ENGINEERED SYSTEMS
ROSEMONT, ILLINOIS

PRINT AND BILL OF MATERIAL ARE NOT TO BE USED WITHOUT THE WRITTEN CONSENT OF CULLIGAN INTERNATIONAL CO.

NAME HI–FLO® 3e
AUTOMATIC SOFTENER DUPLEX
TECHNICAL DATA SHEET

| DETAILED BY: | APP. BY: | SHEET |
|---|---|---|
| KMR 5/03/05 | KSR 01/19/10 | 1 OF 1 |

REF. NO.

PART NO. S3e_2_MVP

CONSULTANT:

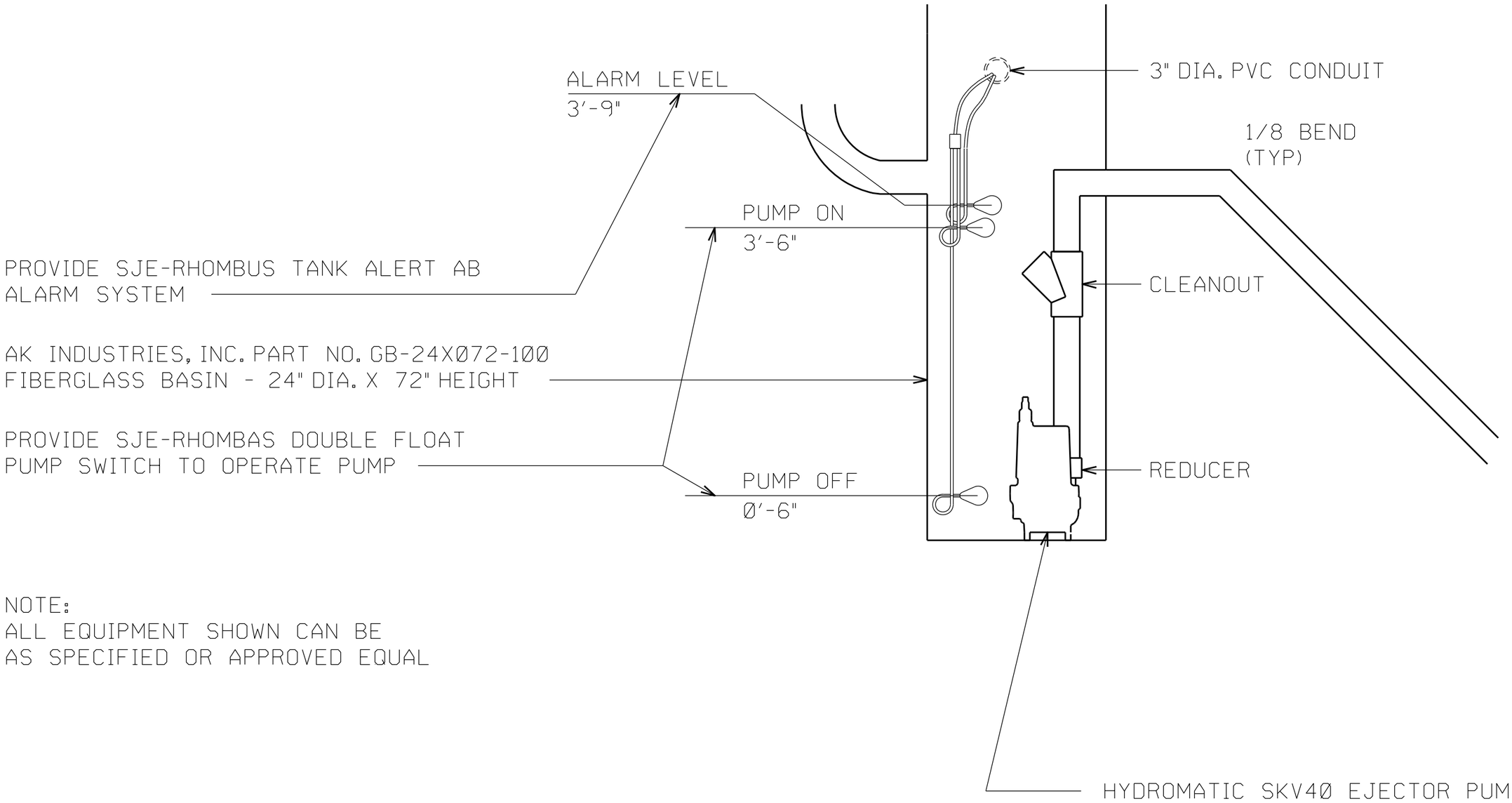
IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

WATER SOFTENER LAYOUT

WATER TREATEMENT SYSTEM REPLACEMENT
LEWIS & CLARK STATE PARK
MONONA COUNTY, IOWA

| NO. | BY | DATE | REVISION |
|---|---|---|---|
| | | | |

DRAWN BY: MH
PROJECT NUMBER: 13-01-67-02
CHK'D BY:
DATE: 7/9/2015
SHEET No: B03




NOTE:
ALL EQUIPMENT SHOWN CAN BE
AS SPECIFIED OR APPROVED EQUAL

CONSULTANT:


IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034


TREATMENT BULDING PUMP

WATER TREATMENT SYSTEM REPLACEMENT

LEWIS & CLARK STATE PARK

MONONA COUNTY, IOWA

| NO. | BY DATE | REVISION |
|---|---|---|

DRAWN BY: M.H

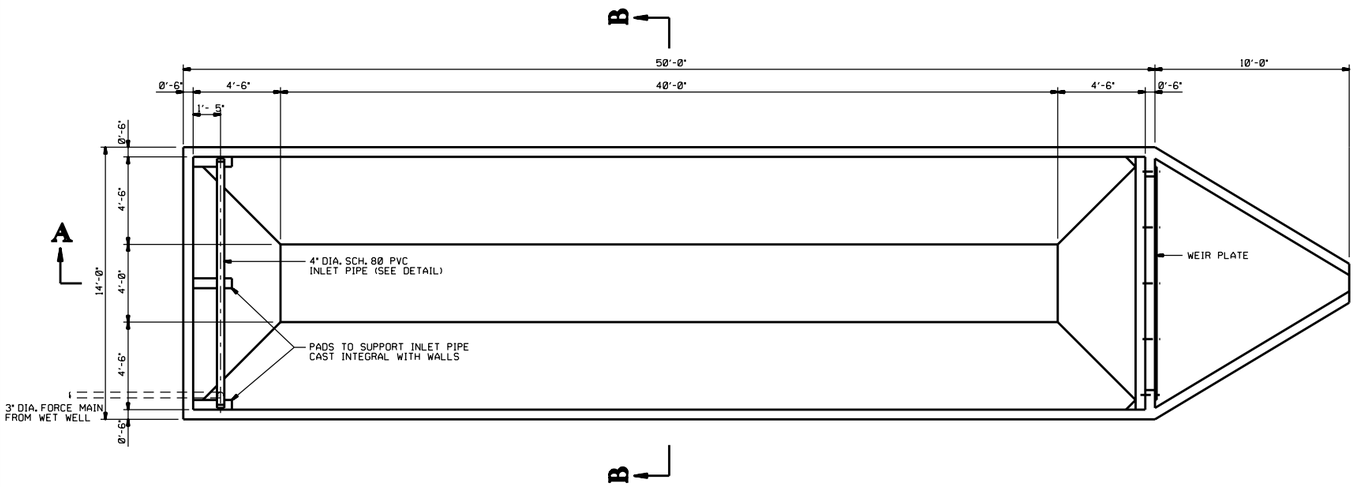
PROJECT NUMBER: 13-01-67-01

CHK'D BY:

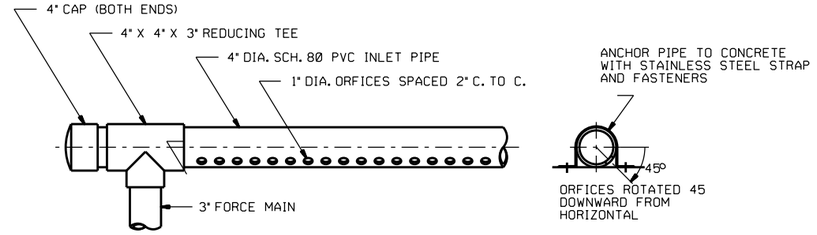
DATE: 7/9/2015

SHEET No:

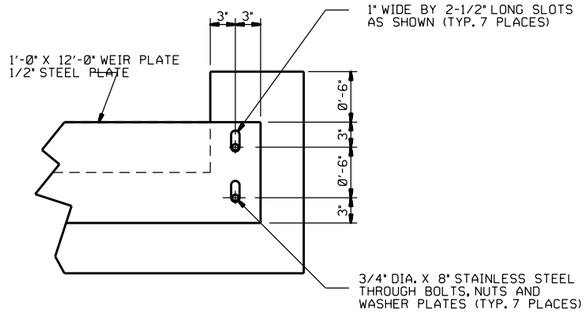
B.04



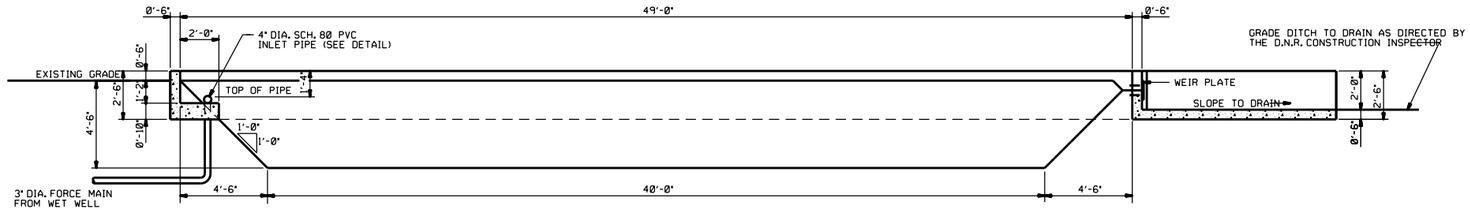

**PLAN**



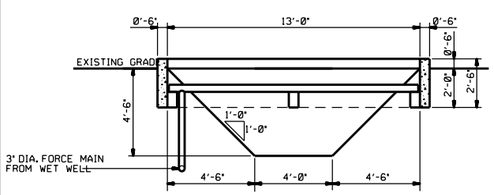

**DETAIL OF INLET PIPE**
NOT TO SCALE



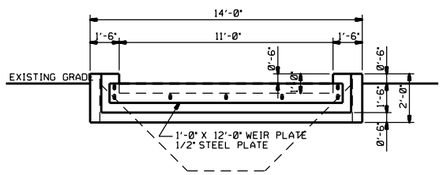

**WEIR PLATE DETAIL**
4X



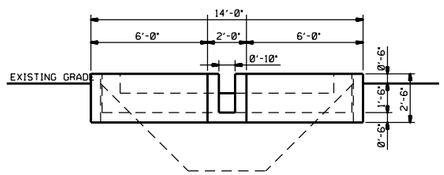

**SECTION A - A**



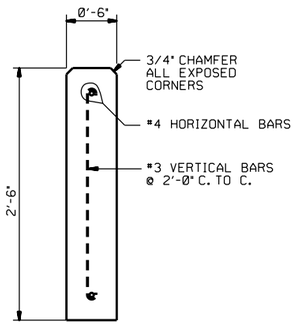

**SECTION B - B**




**WIER ELEVATION**




**END ELEVATION**




**TYPICAL WALL SECTION**
4X

NOTE:
ALL CONCRETE SHALL BE 4000 LB. MIX

CONSULTANT:

**IOWA DEPARTMENT OF NATURAL RESOURCES**

ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

SETTLING BASIN

WATER TREATMENT SYSTEM REPLACEMENT

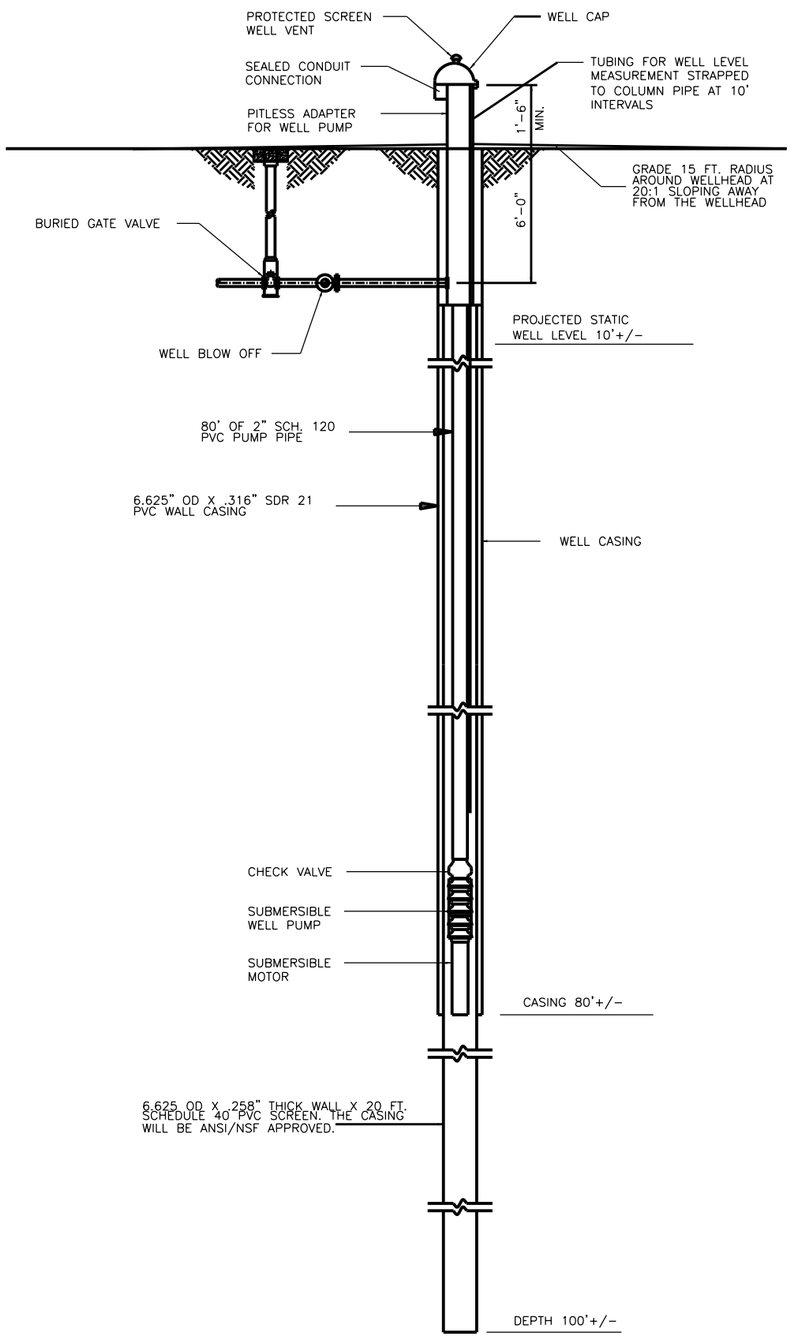
LEWIS & CLARK STATE PARK

MONONA COUNTY, IOWA

| NO. | BY / DATE | REVISION |
|---|---|---|

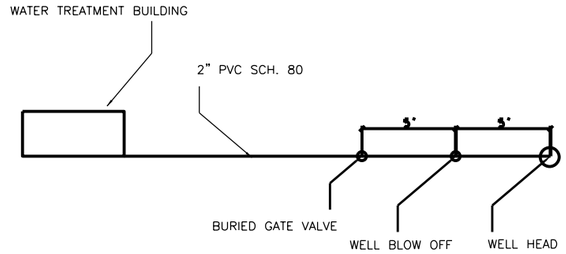
| | |
|---|---|
| DRAWN BY: MH | PROJECT NUMBER: 13-01-67-02 |
| CHK'D BY: MH | DATE: 7/9/2015 |

SHEET No: B.05



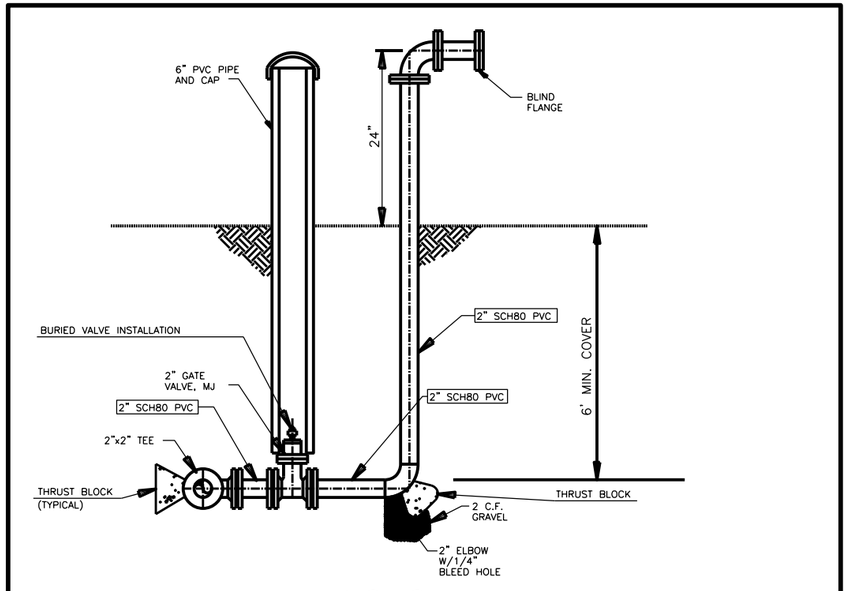

**WELL DETAIL**

NOT TO SCALE




**WELL SCHEMATIC**

NOT TO SCALE




**WELL BLOW OFF**

NOT TO SCALE

1. ALL WORK WILL BE PERFORMED BY A CERTIFIED WELL DRILLER.
2. DNR WILL ONLY OBTAIN WELL CONSTRUCTION PERMIT, ALL OTHER NEEDED PERMITS WILL BE OBTAINED BY THE CONTRACTOR.

CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034

WELL DETAILS

WATER TREATMENT SYSTEM REPLACEMENT

LEWIS & CLARK STATE PARK

MONONA COUNTY, IOWA

| NO. | BY / DATE | REVISION |
|---|---|---|

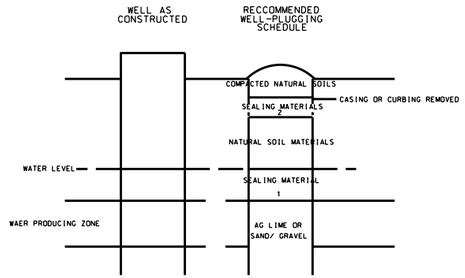
DRAWN BY: M.H

PROJECT NUMBER: 13-01-67-02

CHK'D BY: M.H

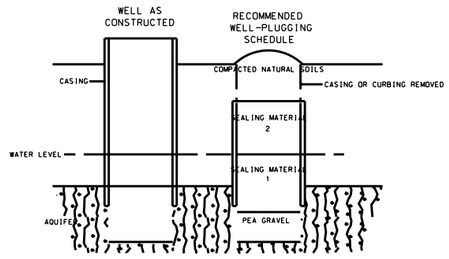
DATE: 7/9/2015

SHEET No: B.06



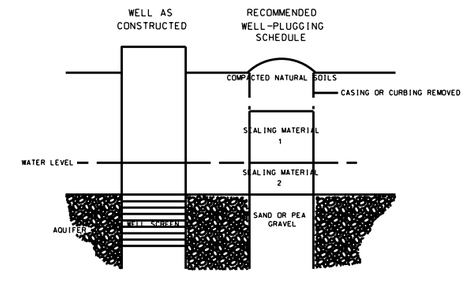

LARGE DIAMETER DUG OR BORED WELLS

1. GRADED BENTONITE. BENTONITE PELLETS. NEAT CEMENT
2. GRADED BENTONITE. BENTONITE PELLETS. NEAT CEMENT. SAND/CEMENT GROUT CONCRETE



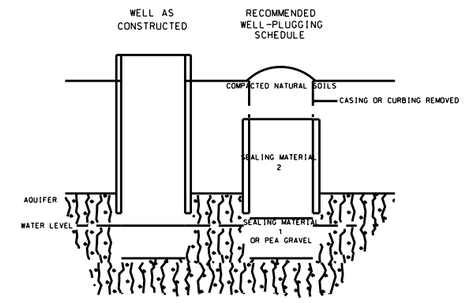

BEDROCK WELL IN CONFINED AQUIFER

1. BENTONITE PRODUCTS. NEAT CEMENT
2. BENTONITE PRODUCTS. NEAT CEMENT. SAND/GRAVEL GROUT. CONCRETE



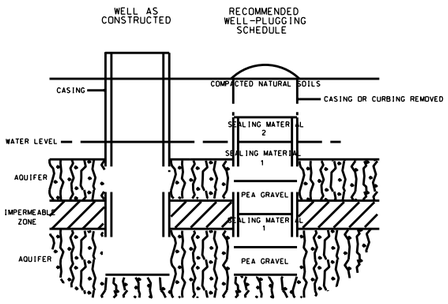

ALLUVIAL AND GLACIAL-DRIFT WELLS

1. BENTONITE PRODUCTS. NEAT CEMENT
2. BENTONITE PRODUCTS. NEAT CEMENT. SAND/CEMENT GROUT. CONCRETE




BEDROCK WELL IN UNCONFINED AQUIFER

1. BENTONITE PRODUCTS. NEAT CEMENT
2. BENTONITE PRODUCTS. NEAT CEMENT SAND/CEMENT GROUT. CONCRETE




LARGE DIAMETER DUG OR BORED WELLS

1. GRADED BENTONITE. BENTONITE PELLETS. NEAT CEMENT
2. GRADED BENTONITE. BENTONITE PELLETS. NEAT CEMENT. SAND/CEMENT GROUT CONCRETE

| NOMINAL (INCHES) | SCHEDULE OR STRENGTH | O.D. INCHES | I.D. INCHES | SECTION ($FT^2$) | GALLONS/ LINEAL FT. | SACKS/ FT. | LINEAL FT./ SACK |
|---|---|---|---|---|---|---|---|
| 2 | 40 | 2.375 | 2.07 | .023 | .17 | .021 | 47.83 |
| | 80 | 4.500 | 1.94 | .021 | .15 | .019 | 52.38 |
| 4 | 40 | 4.500 | 4.02 | .088 | .66 | .080 | 12.50 |
| | 80 | | 3.82 | .080 | .60 | .073 | 13.75 |
| 5 | 40 | 5.563 | 5.04 | .139 | 1.04 | .126 | 7.91 |
| | 80 | | 4.81 | .126 | .95 | .115 | 8.73 |
| 6 | 40 | 6.625 | 6.06 | .201 | 1.50 | .182 | 5.47 |
| | 80 | | 5.76 | .181 | 1.35 | .165 | 6.08 |
| 8 | 30 | 8.625 | 8.07 | .355 | 2.66 | .323 | 3.10 |
| | 40 | | 7.98 | .347 | 2.60 | .316 | 3.17 |
| | 80 | | 7.62 | .317 | 2.37 | .288 | 3.47 |
| 10 | 30 | 10.75 | 10.13 | .560 | 4.19 | .510 | 1.96 |
| | 40 | | 10.02 | .548 | 4.10 | .498 | 2.01 |
| | XS | | 9.75 | .519 | 3.88 | .471 | 2.12 |
| 12 | 30 | 12.75 | 12.09 | .797 | 5.96 | .725 | 1.38 |
| | STD | | 12.00 | .785 | 5.88 | .714 | 1.40 |
| | 40 | | 11.93 | .777 | 5.81 | .707 | 1.42 |
| 14 | STD | 14.00 | 13.25 | .957 | 7.16 | .871 | 1.15 |
| | XS | | 13.00 | .922 | 6.90 | .838 | 1.19 |
| 16 | STD | 16.00 | 15.24 | 1.268 | 9.49 | 1.153 | .87 |
| | XS | | 15.00 | 1.227 | 9.18 | 1.116 | .90 |
| 18 | STD | 18.00 | 17.25 | 1.623 | 12.14 | 1.476 | .68 |
| 20 | STD | 20.00 | 19.25 | 2.021 | 15.12 | 1.837 | .54 |
| 24 | STD | 24.00 | 23.25 | 2.948 | 22.06 | 2.680 | .37 |
| 30 | STD | 30.00 | 29.25 | 4.666 | 34.91 | 4.242 | .24 |

**REFERENCE: SEE IOWA DNR PUBLICATION SERIES NO. 15 FOR FURTHER DETAILS**

CONSULTANT:


IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034


# WELL CAPPING DETAILS

WATER TREATMENT SYSTEM REPLACEMENT

LEWIS & CLARK STATE PARK

MONONA COUNTY, IOWA

| NO. | BY / DATE | REVISION |
|---|---|---|
| | | |

DRAWN BY: M.H

PROJECT NUMBER: 13-01-67-02

CHK'D BY:

DATE: 7/9/2015

SHEET No: B.07

## ESTIMATED PROJECT QUANTITIES

| ITEM | DESCRIPTION | UNIT | TOTAL |
|---|---|---|---|
| 1 | MOBILIZATION | LS | 1 |
| 2 | CLEARING & GRUBBING | LS | 1 |
| 3 | 38'x 22' WATER TREATMENT BUILDING COMPLETE WITH GRADING | LS | 1 |
| 4 | 158 GALLONS WX-451 AMTROL PRESSURE TANK | EA | 2 |
| 5 | STORAGE BUILDING MANIFOLD: WATER METER, VALVES, PRESSURE SWITCH, PRESSURE GAUGE, SCH. 80 PVC PIPING ETC. | LS | 1 |
| 6 | CHLORINE FEED SYSTEM WITH 1 PUMP, 20 GALLON TANK AND SPILL PALLET COMPLETE | LS | 1 |
| 7 | TRIPLEX MULTI-MEDIA IRON FILTER SYSTEM COMPLETE WITH CHLORINE INJECTION PUMP | LS | 1 |
| 8 | DUPLEX AUTOMATIC SOFTENER SYSTEM WITH BRINE TANK COMPLETE | LS | 1 |
| 9 | ELECTRICAL SERVICE AND PUMP CONTROLS COMPLETE WITH LIGTING, HEATER AND 200 AMP CONTROL PANEL AND OTHER ACCESSORIES SHOWN IN PLANS | LF | 1 |
| 10 | NEW ELECTRICAL SERVICE TO THE BUILDING FROM 70 FEET WITH A DISCONECT | LS | 1 |
| 11 | SUMP AND SUBMERSIBLE PUMP INSIDE BUILDING, COMPLETE | LS | 1 |
| 12 | 3" DIA. HDPE DR 11 FORCEMAIN TRENCHED OR BORED IN PLACE TO SETTLING BASIN | LF | 150 |
| 13 | SETTLING BASIN | LS | 1 |
| 14 | 3" DIA HDPE (DR 11) WATERMAIN, BORED OR TRENCHED | LF | 200 |
| 15 | TRACER WIRE #12 OR 3" DETACTABLE "WATER" TAPE | LF | 350 |
| 16 | SYSTEM DISINFECTION | LS | 1 |
| | **NEW 6" WATER SUPPLY WELL** | | |
| 17 | DRILL 12" HOLE, FURNISH 6" PVC SDR 21 WELL CASING PIPE AND PCC GROUT | LF | 80 |
| 18 | 6" DIA X 20' OF PVC SLOTTED WELL SCREEN WITH GRAVEL PACK IN 12" HOLE | LF | 20 |
| 19 | 2" X 60' SCH 120 PVC DROP PIPE | LF | 80 |
| 20 | 5HP 3PH SUBMERSIBLE VARIABLE SPEED PUMP RATED TO PROVIDE 65 GPM OUTPUT AT 70 PSI AT SURFACE. INCLUDING 3PH WIRING TO THE VFD TO TREATMENT BUILDING | LS | 1 |
| 21 | PITLESS ADAPTER UNIT | EA | 1 |
| 22 | STATIC WATER PRESSURE LINE AND GUAGE | LS | 1 |
| 23 | INSTALL WELL BLOW-OFFF ASSEMBLY & PVC CL 160 WATER LINE FROM WELL TO BUILDING | LS | 1 |
| 24 | DEVELOP WELL AND TEST PUMPING | LS | 1 |
| 25 | DISINFECTION AND CHEMICAL ANALYSIS | LS | 1 |
| 26 | GRADE AREA AROUND WELL HEAD AS SHOWN AND SEED | LS | 1 |
| 27 | DRILL 12" HOLE AND 6" PVC SDR 21 WELL CASING AND GROUT FOR ADDITIONAL DEPTH | LF | 1 |
| | | | |
| | **ABANDON AND PLUG EXISTING WELL & DEMOLITION** | | |
| 28 | REMOVE PUMP & PLUG EXISTING WELL | LS | 1 |
| 29 | DEMOLISH APPROX. 28'X28' EXISTING TREATMENT BUILDING INCLUDING ASBESTOS ABATEMENT. REMOVE PRESSRE TANKS, MIXING TANKS, INTERNAL PIPING, ETC. HAUL AND DISPOSE OFF SITE. | LS | 1 |
| 30 | DEMOLISH 28'X24'X6' DEEP CONCRETE STORAGE TANK, HAUL AND DISPOSE OFF SITE | LS | 1 |
| 31 | SEED ALL DISTURBED AREAS | LS | 1 |
| | | | |

## GENERAL NOTES:

| ITEM | DESCRIPTION |
|---|---|
| A. | The contractor shall notify the following two weeks prior to construction:<br>1. District Inspector:<br>Jeff Felts<br>(515)- 250-3712<br><br>2. Project Manager:<br>Mike Hameed<br>(515) 725-8467 |
| B. | The contractor shall verify actual locations and elevations with the D.N.R Inspector. |
| C. | All work shall conform to and be performed in accordance with all applicable codes and ordinances. |
| D. | The contractor shall visit the site and inspect the project area and thoroughly familiarize themselves with the actual job conditions prior to the start of work. Failure to visit the project site shall not relieve the contractor from performing the work in accordance to the plans, specifications, special provisions and contract. |
| E. | The contractor shall verify, at the site, all dimensions and conditions shown on the plans and shall notify the D.N.R Inspector of any discrepancies, omissions and/or conflicts prior to proceeding with the work. |
| F. | The contractor is responsible for providing waste area or disposal for excess material (excavated material or broken concrete) which is not desirable to be incorporated into the work involved on this project. No payment for overhaul will be allowed for material hauled to off site for disposal. No material shall be placed within the right-of-way, unless specifically stated in the plans or approved by the D.N.R Inspector. |
| G. | The contractor shall not disturb desirable grass areas and desirable trees outside construction limits. The contractor will not be permitted to park or service vehicles and equipment or use these areas for storage of materials. Storage, parking and service areas will be subject to the approval of the D.N.R inspector. |
| H. | The contractor is expected to have materials, equipment and labor available on a daily basis to install and maintain erosion control features on the project. |
| I. | The contractor shall be responsible for any damage to existing facilities resulting from their negligence, or that of a subcontractor, and said repairs shall be approved by the owner. |
| J. | The contractor is responsible for any electrical inspection by the state inspector and also obtaining any demolition permits and application fees. Contracter also needs to contact Western Iowa Power Cooperative to check for other requirements before tapping for new connection. |
| K. | Contractor is responsible that all of the equipment in the treatment building is functioning properly and the final effluent quality meets the effluent requirements specified in the specifications. |

CONSULTANT:


IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034


ESTIMATED QUANTITIES_

WATER TREATEMENT SYSTEM REPLACEMENT

LEWIS & CLARK STATE PARK

MONONA COUNTY,IA

| NO. | BY / DATE | REVISION |
|---|---|---|
| | | |

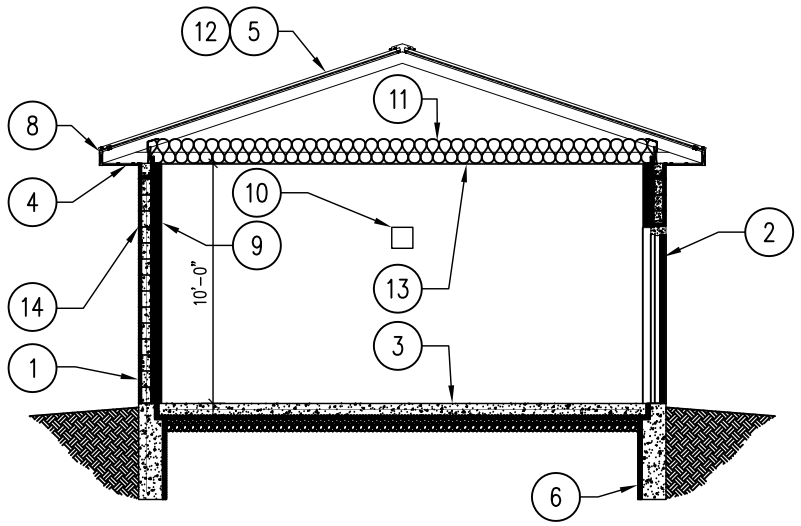
DRAWN BY: ES

PROJECT NUMBER: 13-03-33-02

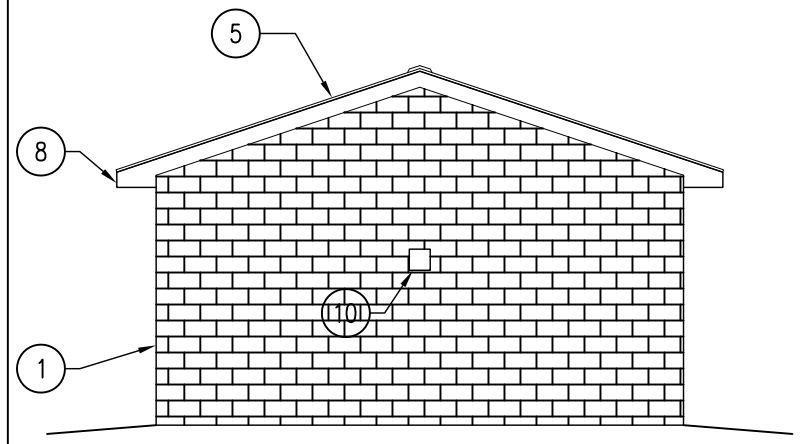
CHK'D BY: MH

DATE: 09/2014

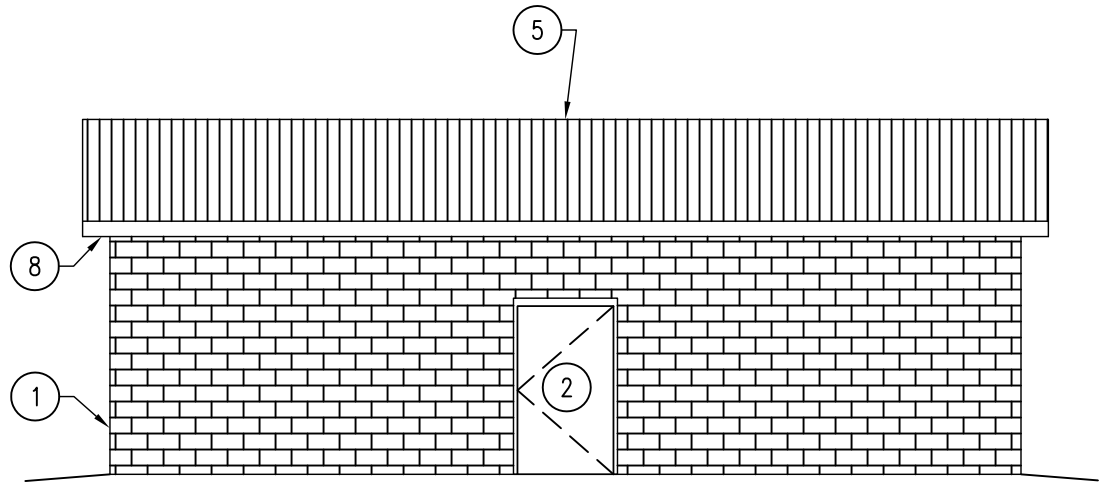
SHEET No: C.01



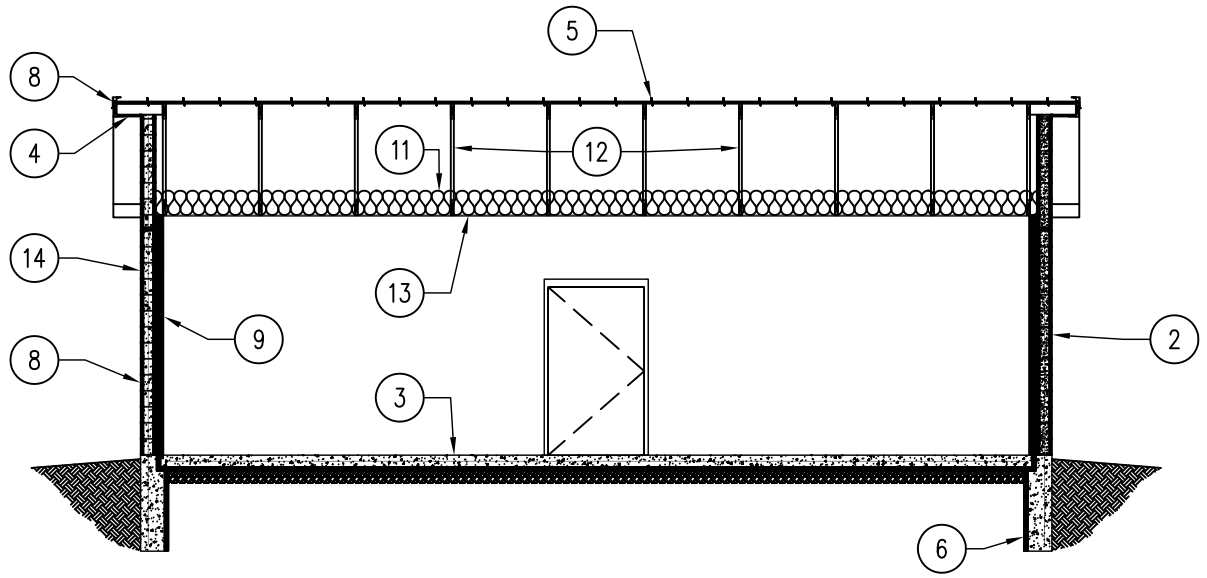

05 BUILDING ELEVATION
SCALE: 1/8" = 1'-0"



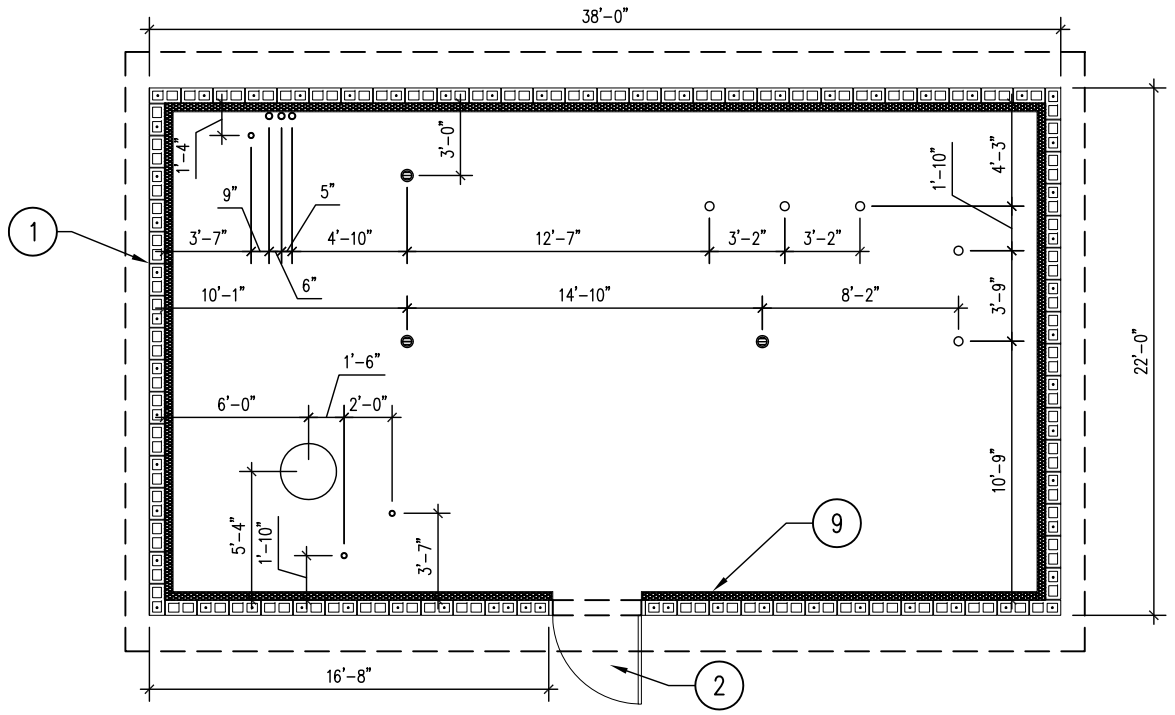

04 BUILDING ELEVATION
SCALE: 1/8" = 1'-0"




03 BUILDING ELEVATION
SCALE: 1/8" = 1'-0"




02 BUILDING SECTION
SCALE: 1/8" = 1'-0"




01 REFERENCE FLOOR PLAN
SCALE: 1/8" = 1'-0"

## KEYNOTES

1. 8X8X16 CMU SPLIT-FACE BLOCK WALL, WITH #4 REBAR EVERY THIRD CELL AND HORIZONTAL BED JOINT REINFORCEMENT EVERY 32" VERTICALLY. FULLY-GROUT ALL CELLS.
2. 16 GAUGE, 48"X84" STEELCRAFT "L" SERIES FLUSH DOOR WITH POLYURETHANE INSULATION AND STEEL FRAME, BUTT IN JAMB.
3. 6" CONCRETE SLAB WITH #4 REBAR EVERY 32" O.C. BOTH DIRECTIONS. SLAB TO RECEIVE 2" RIGID SUB-SLAB INSULATION UNDER ENTIRE SLAB, TAPED AND SEALED, AS SHOWN, WITH 6" SUBBASE ROCK.
4. STEEL VENTED FLUSH SOFFIT PANELS, TO MATCH ROOF COLOR.
5. 24 GA. PAC-CLAD STEEL SNAP-CLAD ROOF WITH DARK BRONZE COLOR AND VENTED ROOF.
6. 42" MINIMUM DEPTH TRENCH FOOTING 12" WIDE, #4 REBAR 12" O.C. BOTH DIRECTIONS
7. METAL DRIP EDGE, MATCH ROOF COLOR.
8. WRAP FASCIA WITH COIL METAL, MATCH ROOF COLOR.
9. 3 5/8" 26 GA. GALVANIZED STEEL STUDS, 24" O.C. WITH CLOSED CELL SPRAY FOAM ENTIRE CAVITY. SHEATH WALL AND CEILING WITH ½" REWALL NAKED BOARD.
10. CUT A 10 ½" X 10 ½" HOLE IN MASONRY FOR FAN INSTALLATION, REFER TO CIVIL PLANS FOR MORE INFORMATION.
11. R-42 BATT INSULATION OVER 10MIL VAPOR BARRIER.
12. TRUSS AND TRUSS DESIGN BY CONTRACTOR.
13. ½" REWALL NAKED BOARD.
14. CMU SPLIT-FACE BOND BEAM AROUND ENTIRE PERIMETER OF BUILDING, MATCH BUILDING CMU.
15. 2X6 OUTRIGGER FOR GABLED END OF ROOF.

## GENERAL NOTES

A. CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
B. CONTRACTOR TO SUBMIT SAMPLES OF SPLIT-FACE BLOCK FOR APPROVAL PRIOR TO CONSTRUCTION FOR COLOR SELECTION.
C. CONTRACTOR TO VERIFY ALL PLUMBING REQUIREMENTS AND PENETRATIONS IN BUILDING SLAB. REFER TO MECHANICAL LAYOUT DRAWINGS FOR EXACT DIMENSIONS AND PLACEMENT OF DRAIN HOLE AND SLAB PENETRATIONS.

SEAL

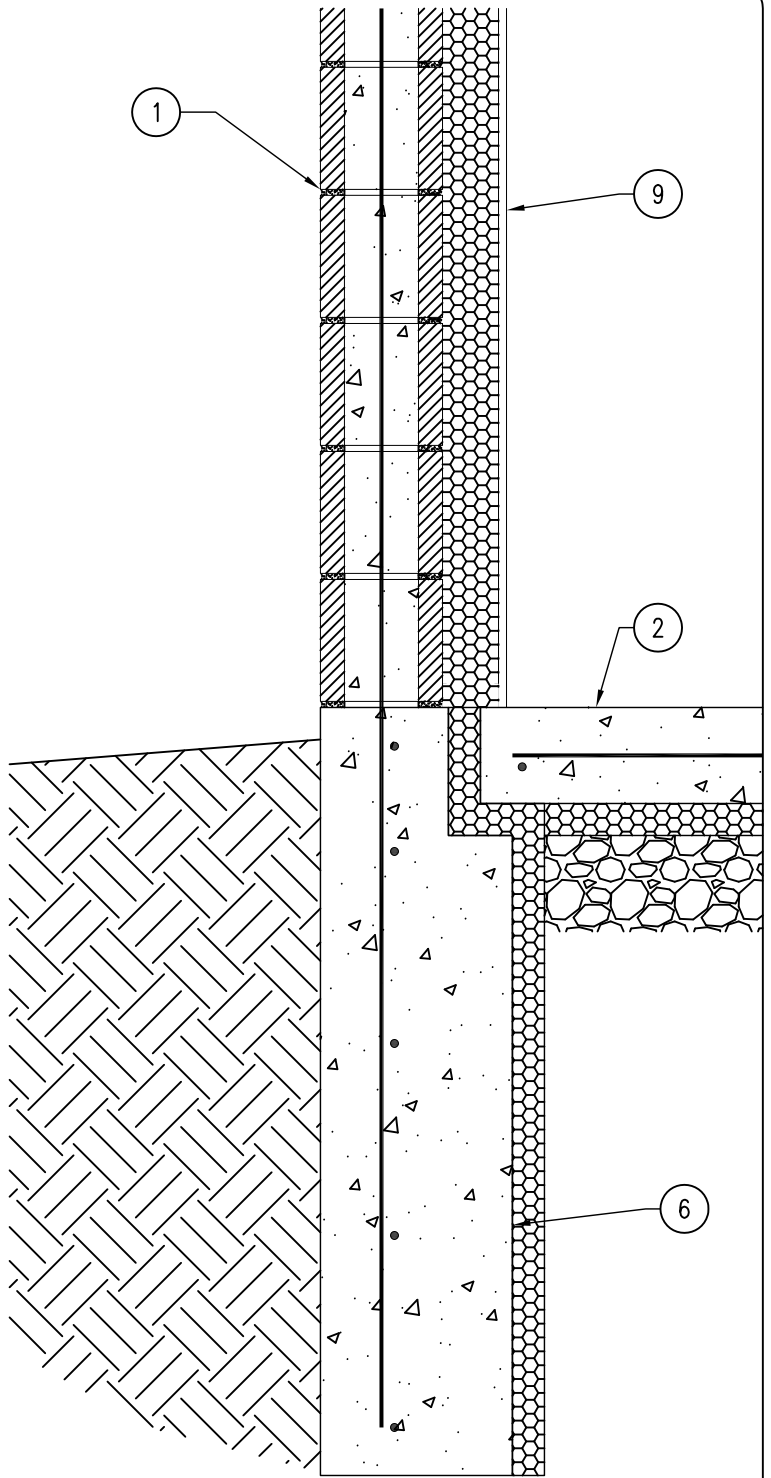

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034
P: 515.725.8200
F: 515.725.8202


# WATER TREATMENT BUILDING FOR: LEWIS & CLARK STATE PARK

21914 PARK LOOP, ONAWA MONONA COUNTY, IA

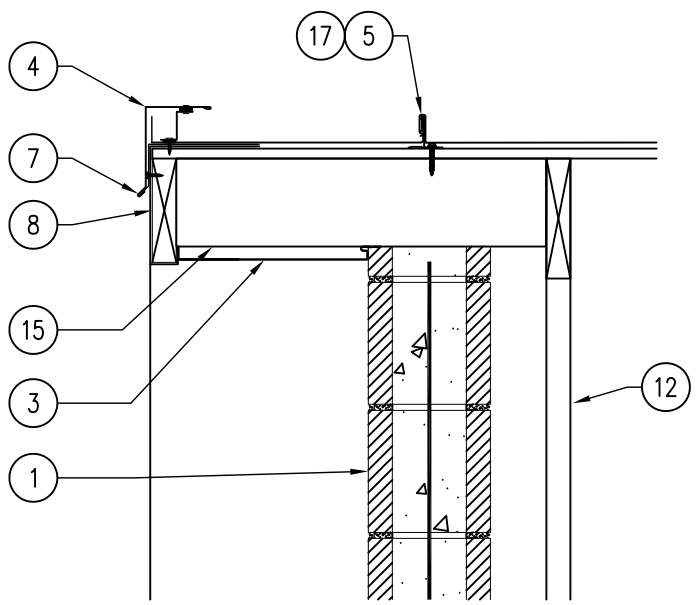
| DRAWN BY: | PROJECT NUMBER: 13-01-67-02 |
|---|---|
| CHK'D BY: | DATE: 11.18.2015 |

SHEET No: **D.01**



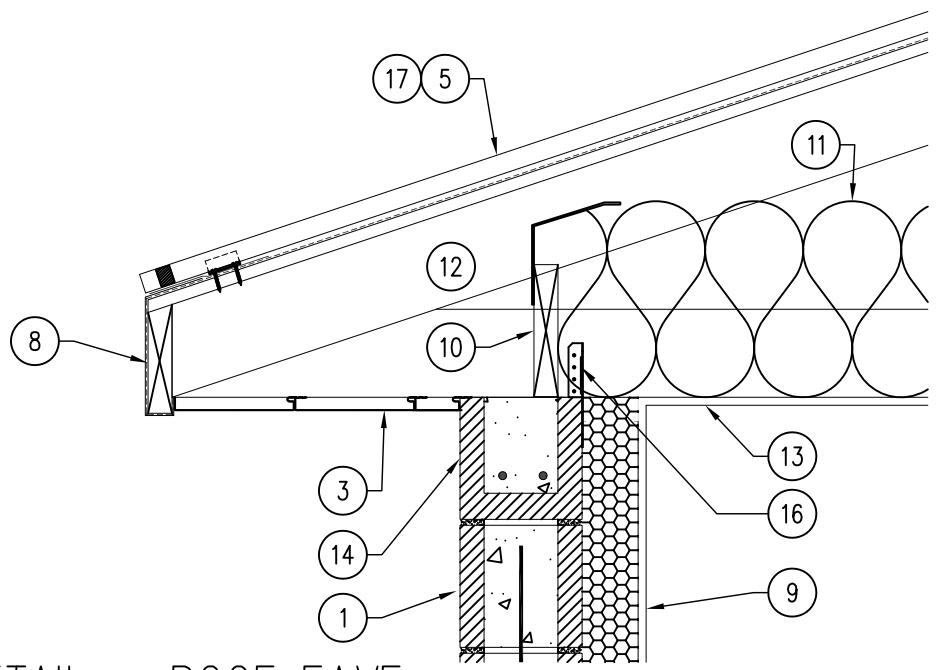

03 DETAIL – TRENCH FOOTING
SCALE: 1" = 1'–0"

05 NOT USED
SCALE: 1/8" = 1'–0"




02 DETAIL – ROOF GABLE
SCALE: 1" = 1'–0"

04 NOT USED
SCALE: 1/8" = 1'–0"




01 DETAIL – ROOF EAVE
SCALE: 1" = 1'–0"

## KEYNOTES

1. 8X8X16 CMU SPLIT–FACE BLOCK WALL, WITH #4 REBAR EVERY THIRD CELL AND HORIZONTAL BED JOINT REINFORCEMENT EVERY 32" VERTICALLY. FULLY–GROUT ALL CELLS.
2. 6" CONCRETE SLAB WITH #4 REBAR EVERY 32" O.C. BOTH DIRECTIONS. SLAB TO RECEIVE 2" RIGID SUB–SLAB INSULATION UNDER ENTIRE SLAB, TAPED AND SEALED, AS SHOWN, WITH 6" SUBBASE ROCK.
3. STEEL VENTED FLUSH SOFFIT PANELS, TO MATCH ROOF COLOR.
4. ROOF GABLE RAKE BY ROOFING MANUFACTURER.
5. 24 GA. PAC–CLAD STEEL SNAP–CLAD ROOF WITH DARK BRONZE COLOR AND VENTED RIDGE WITH WATER & ICE SHIELD OVER ENTIRE ROOF.
6. 42" MINIMUM DEPTH TRENCH FOOTING 12" WIDE, #4 REBAR 12" O.C. BOTH DIRECTIONS.
7. METAL DRIP EDGE, MATCH ROOF COLOR.
8. 2X FASCIA, WRAP FASCIA WITH COIL METAL, MATCH ROOF COLOR.
9. 3 5/8" 26 GA. GALVANIZED STEEL STUDS, 24" O.C. WITH CLOSED CELL SPRAY FOAM ENTIRE CAVITY. SHEATH WALL AND CEILING WITH ½" REWALL NAKED BOARD.
10. INSULATION BAFFLE.
11. R–42 BATT INSULATION OVER 10MIL VAPOR BARRIER.
12. TRUSS AND TRUSS DESIGN BY CONTRACTOR.
13. ½" REWALL NAKED BOARD.
14. CMU SPLIT–FACE BOND BEAM AROUND ENTIRE PERIMETER OF BUILDING, MATCH BUILDING CMU.
15. 2X6 OUTRIGGER FOR GABLED END OF ROOF.
16. SIMPSON TRUSS CLIP, AS REQUIRED BY CODE.
17. ¾" PLYWOOD ROOF SHEATHING OVER ENTIRE ROOF.

## GENERAL NOTES

A. CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
B. CONTRACTOR TO SUBMIT SAMPLES OF SPLIT–FACE BLOCK FOR APPROVAL PRIOR TO CONSTRUCTION FOR COLOR SELECTION.
C. CONTRACTOR TO VERIFY ALL PLUMBING REQUIREMENTS AND PENETRATIONS IN BUILDING SLAB.

SEAL

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILDING
502 E. 9TH ST., DES MOINES, IA 50319-0034
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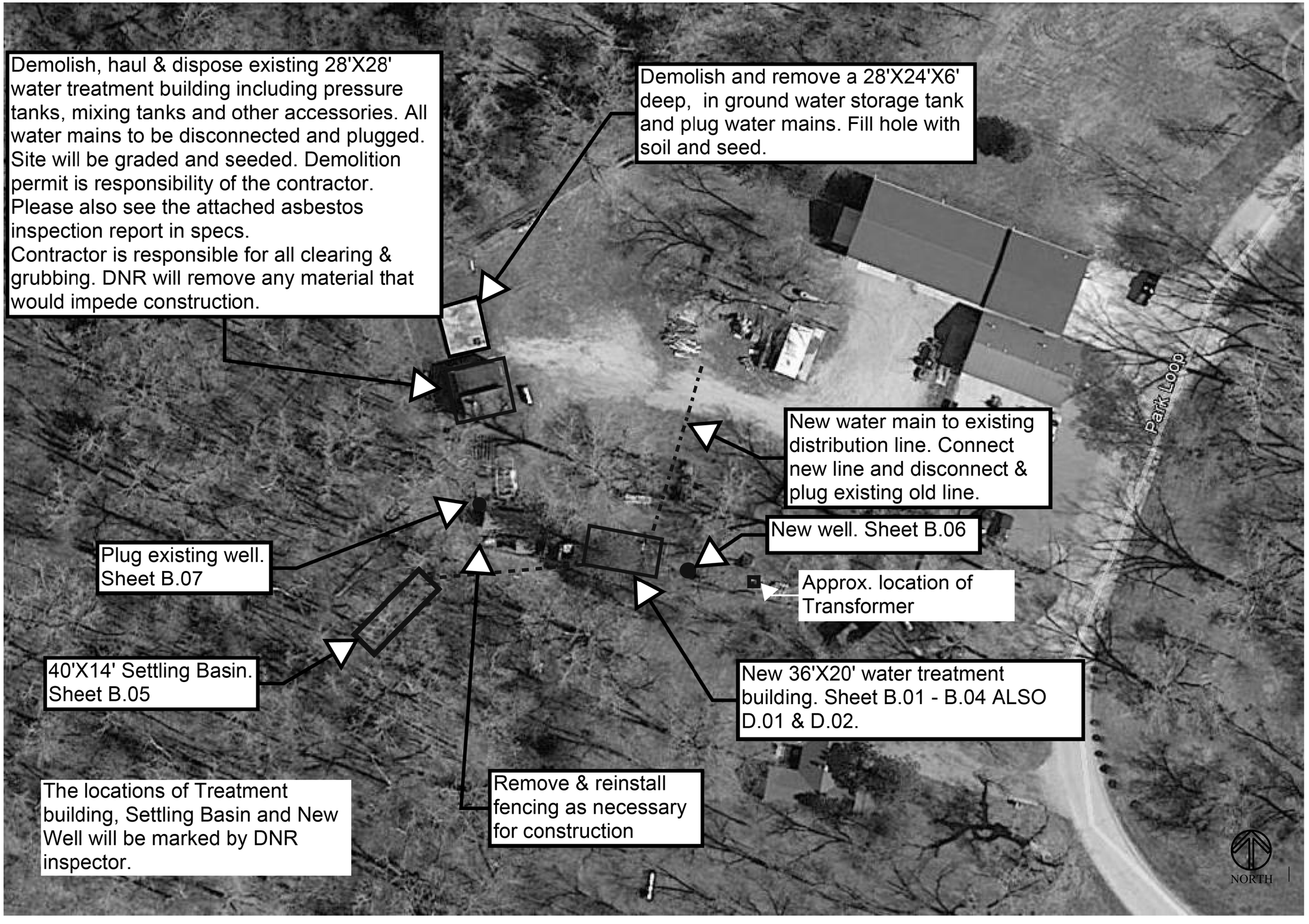
WATER TREATMENT BUILDING FOR:
# LEWIS & CLARK STATE PARK
21914 PARK LOOP, ONAWA MONONA COUNTY, IA

DRAWN BY:
PROJECT NUMBER: 13-01-67-02
CHK'D BY:
DATE: 11.18.2015
SHEET No:
**D.02**




CONSULTANT:

IOWA DEPARTMENT OF NATURAL RESOURCES
ENGINEERING SERVICES - WALLACE BUILING
502 E. 9TH ST., DES MOINES, IA 50319-0034

DNR

SITE PLAN

WATER TREATMENT SYSTEM REPLACEMENT
LEWIS & CLARK STATE PARK
MONONA COUNTY, IOWA

| NO. | BY DATE | REVISION |
|---|---|---|

DRAWN BY: M.H
PROJECT NUMBER: 13-01-67-02
CHK'D BY:
DATE: 7/9/2015
SHEET No: D.03